● PRINTER RUSH ●
(PTO ASSISTANCE)

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From:	MR	**Location:**	(IDC) FMF FDC	**Date:**	05-13-05

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[RUSH] **MESSAGE:** Some Datas on specification pages 9, 11 and 14 are illegible.

Please provide clear copies.

Thank you,
MR

[XRUSH] **RESPONSE:** Data Supplied

INITIALS: DH

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TO: Ollie Person FACSIMILE NO.: (703) 308-6642

FROM: Ian Volek NO. OF PAGES INCLUDING THIS PAGE: 3

Serial No. 10/659,494

MESSAGE: As requested by you, transmitted herewith are pages 9 and 11 of the specification as filed. Please note that page 11 of the specification was amended in the Amendment filed on March 1, 2005.

CONFIDENTIALITY NOTICE

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substrate 4. This top plate frame 6 seals a part of the top surface of the channel 5, whereby pressure chambers 7 (7a, 7b, 7c .....) are formed.

The space between the adjacent pressure chambers 7 is composed of the lower piezoelectric member 2 and the upper piezoelectric member 3 and is partitioned by side walls 8 (8a, 8b, 8c, ...) that form pressure means for varying the capacity in the pressure chamber 7 in accordance with a driving signal.

The top plate frame 6 is provided with an ink supplying path 9 that communicates with all pressure chambers 7.

A top plate frame 10 is adhered onto the top surface of the top plate frame 6. This top plate 10 is provided with an ink supplying opening 11 communicating with the ink supplying path 9. Connected to the ink supplying opening 11 is an ink supplying pipe (not shown) for supplying ink to the ink jet head 1.

Provided at the inner surface of each channel 5 are electrodes 12 (12a, 12b, 12c, ...) electrically independent to one another. The electrode 12 in this embodiment is made by non-electrolysis nickel plating. Each electrode 12 is connected to a driver IC (not shown) that is driving means via a flexible cable 13 connected to the rear end section of the substrate 4.

A nozzle plate 14 made of polyimide is adhered onto the front side of the pressure chamber 7. Mounted at this nozzle

walls 8d and 8e. The side walls 8d and 8e respectively bend in the opposite direction for increasing the capacity in the pressure chamber 7e as shown in Fig. 3 due to an inverse piezoelectric effect caused by the electric field perpendicular to the polarizing direction, thereby producing a shear strain. This increases the capacity in the pressure chamber 7e (Fig. 3(a)). Further, when a positive driving signal is applied to the electrode 12e from the driver IC, the capacity in the pressure chamber 7e is decreased on the contrary (Fig. 3(b)). As described above, applying the driving signal to the electrode 12e enables to selectively vary the capacity in the pressure chamber 7e. When the capacity in the pressure chamber 7e increases, the pressure of the ink in the pressure chamber 7e is reduced, thereby causes a pressure fluctuation starting with a negative polarity in the ink in the pressure chamber. Further, when the capacity in the pressure chamber 7e decreases, the pressure of the ink in the pressure chamber 7e is increased, thereby causes a pressure fluctuation starting with a positive polarity in the ink in the pressure chamber 7e. The ink in the pressure chamber 7e is ejected from the ejecting nozzle 15e as ink droplets when the pressure fluctuation is overlapped with each other to thereby increase the pressure of the ink in the pressure chamber 7e.

Subsequently, the dummy nozzle 16 and the ejecting nozzle 15 are explained. Fig. 4 is a sectional view showing shapes of the dummy nozzle 16 and the ejecting nozzle 15. The dummy